(2)

AFOEHL REPORT 90-143EQ00194HEF

Source Emissions Testing of the Air Stripping Process Vance AFB OK

ROBERT D. BINOVI, Lt Col, USAF BSC
RONALD W. VAUGHN, Capt, USAF, BSC

AUGUST 1990

Final Report

AF Occupational and Environmental Health Laboratory (AFSC)
Human Systems Division
Brooks Air Force Base, Texas 78235-5501

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This report has been reviewed and is approved for publication.

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Chief, Bioenvironmental Engineering Division

REPORT DOCUMENTATION PAGE

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13. ABSTRACT (Maximum 200 words)

At the request of HQ ATC/DEEV through HQ ATC/SGPB, source emissions testing for methylene chloride emissions in the air stripping tower vent and tower influent and effluent was performed at the pretreatment facility at Vance AFB on 21-25 May 90. Testing was conducted to provide data for the air quality permit to operate the pretreatment facility's air stripping tower as required by the Oklahoma State Department of Health. Results show the plant has operational problems, based on the percent removal calculations from the wastewater stream. The pretreatment plant is also not meeting the Federal pretreatment standard limits for methylene chloride from a new facility treating metal finishing waste (40 CFR 433.17). Recommendations included: (1) optimizing the plant operations by determining proper coagulant dosage and cleaning the stripping tower; (2) contacting the manufacturer to determine the design efficiency of the stripping tower; if not efficient enough, additional treatment such as carbon absorption needs to be added; and (3) completing another round of emissions testing after the plant's operation has been optimized.

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Source Emission Testing Stack Sampling Vaughn Binovi Pretreatment Plant Methylene Chloride Vance Air Stripping Process Chemical Oxygen Demand	37
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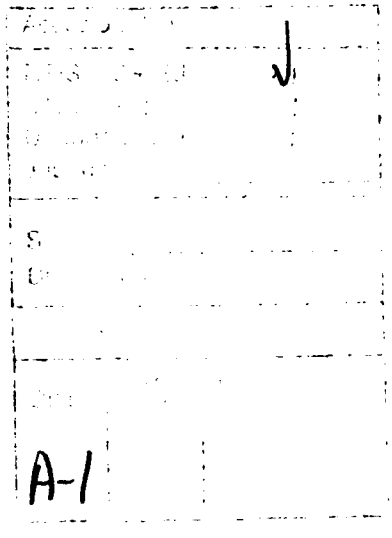
CONTENTS



Illustrations

Table

I. INTRODUCTION

On 21-25 May 90, source emissions testing for methylene chloride emissions in the air stripping tower vent and tower influent and effluent was performed at the pretreatment facility at Vance AFB by personnel of the Environmental Quality Division of the Air Force Occupational and Environmental Health Laboratory (AFOEHL). Chemical oxygen demand (COD) concentrations in the tower influent and effluent were determined as well. This survey was performed at the request of HQ ATC/DEEV through HQ ATC/SGPB to provide data for the air quality permit to operate the facility's air stripping tower. Personnel involved with on-site testing are listed in Appendix A.

II. DISCUSSION

A. Background

HQ ATC/DEEV through HQ ATC/SGPB requested this survey to provide data for the air quality permit to operate the pretreatment facility's air stripping tower (Appendix B). The Oklahoma State Department of Health required the following testing in the permit to construct:

1. Methylene chloride emission rate in the air stripper vent.

2. Methylene chloride concentration in the air stripper influent and effluent by gas chromatography.

3. COD concentration in the air stripper influent and effluent by Hach test kit. A correlation between COD and methylene chloride concentrations in the influent and effluent would also be established.

B. Site Description

The pretreatment facility, building 193, is located on the Vance AFB flight line. The facility treats waste from the corrosion control, jet engine intermediate maintenance, nondestructive inspection, aircraft maintenance, and base motor pool shops. A schematic of the facility is shown in Figure 1. Methylene chloride is stripped in two air strippers in series and then vented through the roof to the atmosphere. The air stripper was manufactured by Fiberglass Structures and has NOR-PAC packing. The unit does not have any air pollution control equipment.

The pretreatment facility is operated five days per week and approximately six hours per day. The flow rate in the facility averaged 6.3 gallons per minute. The facility discharges into an existing sanitary sewer manhole. The base's sanitary waste is treated off-base by the City of Enid.

C. Applicable Standards

Standards applicable to this pretreatment facility are defined under the Oklahoma State Department of Health construction permit 88-054-C and 40 CFR 433. These regulations, detailed in Appendix C, address two areas.

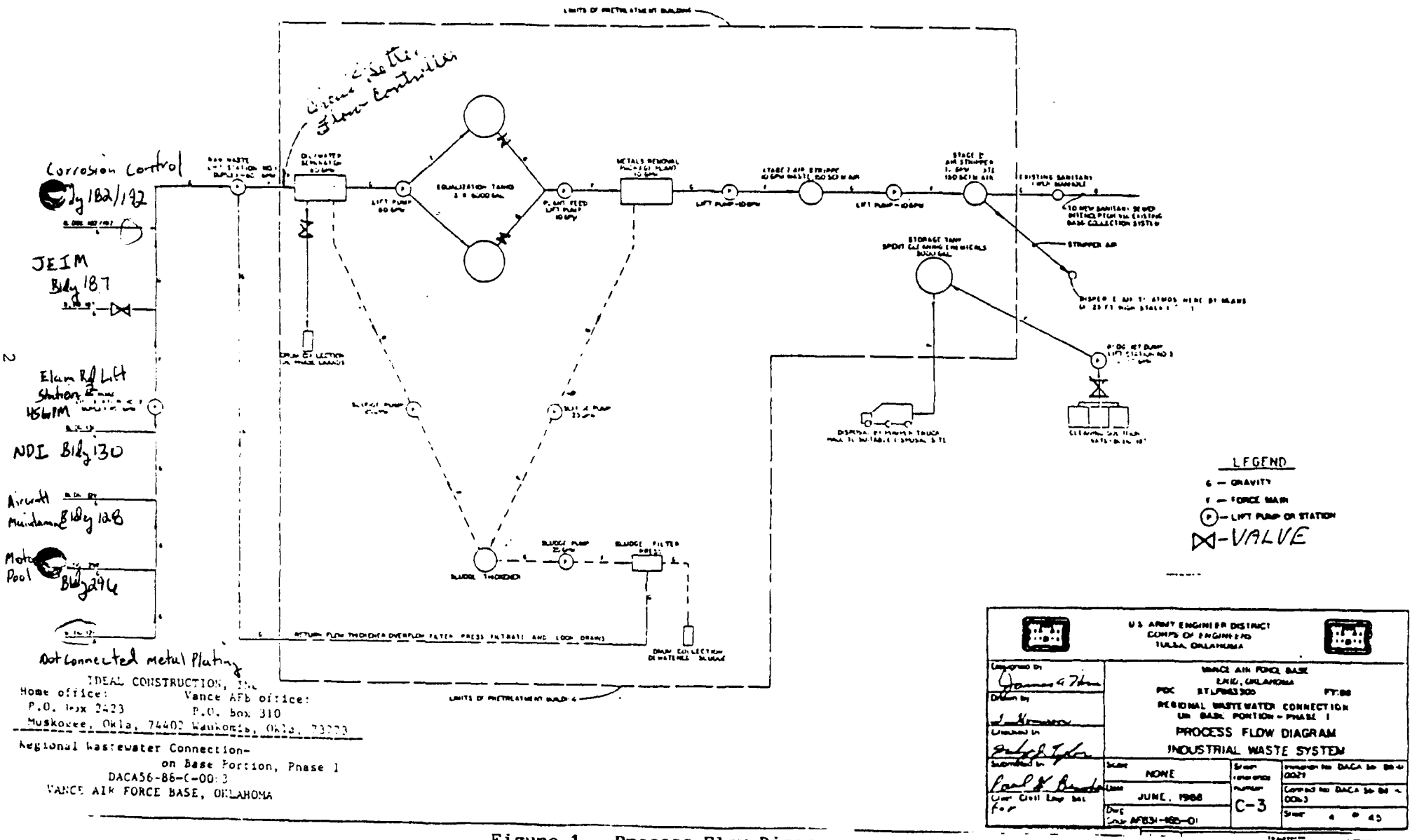


Figure 1. Process Flow Diagram

a. Construction permit 88-054-C: prohibits the emission of methylene chloride from the air stripper to the atmosphere in excess of 3.75 pounds per hour. A correlation of methylene chloride versus COD concentrations in the influent and effluent shall be established. In order for this correlation to be acceptable as a surrogate or methylene chloride analysis, a correlation coefficient approaching 1.0 must be obtained.

b. 40 CFR 433: prohibits the emission of total toxic organics into a publicly owned treatment works in excess of 2.13 milligrams per liter. Methylene chloride is included in the list of toxic organics.

D. Sampling Methods and Procedures

1. Air Emissions

Present regulations require that all emissions testing be conducted in accordance with Appendix A to Title 40, Code of Federal Regulations, Part 60 (40 CFR 60). Therefore, sample train preparation, sampling and recovery, calculations and quality assurance were done in accordance with methods and procedures outlined in 40 CFR 60, Appendix A. Method 18 and NIOSH Method #329.

One sampling port was installed at a right angle to the air stripper vent. This port was installed approximately 8 duct diameters downstream and 2 duct diameters upstream from any flow disturbance. Sampling was conducted at the center of the vent.

Methylene chloride samples were collected using the sampling train shown in Figure 2. The train consisted of a metal probe, two charcoal tubes connected in series, and a pumping device. Vent gas velocity pressure was measured at the end of the probe using a Type S pitot tube connected to a 10-inch inclined-vertical manometer. A thermometer was used to measure vent gas and sampling train temperatures. The pumping device was calibrated before and after sampling.

All calculations were made using the Environmental Protection Agency publication entitled "Source Test Calculations and Check Programs for Hewlett-Packard Calculators", (EPA-340/1-85-013) and associated software programs. Methylene chloride samples were analyzed by gas chromatography.

2. Wastewater Sampling

Hourly grab samples for Chemical Oxygen Demand (COD) and Volatile Halocarbon Screen (EPA Method 601) were taken from the air stripping tower influent and effluent. Influent samples were taken from the metal removal process clarifier effluent (Figure 3). Effluent samples were taken from the plant discharge into a manhole outside the facility (Figure 4).

COD analyses were performed on site; the Hach Company closed reflux, colorimetric method was used to determine the COD concentration in each sample. The volatile samples were analyzed for methylene chloride and other volatile organic compounds by AFOEHL Analytical Services Division using EPA Method 601.

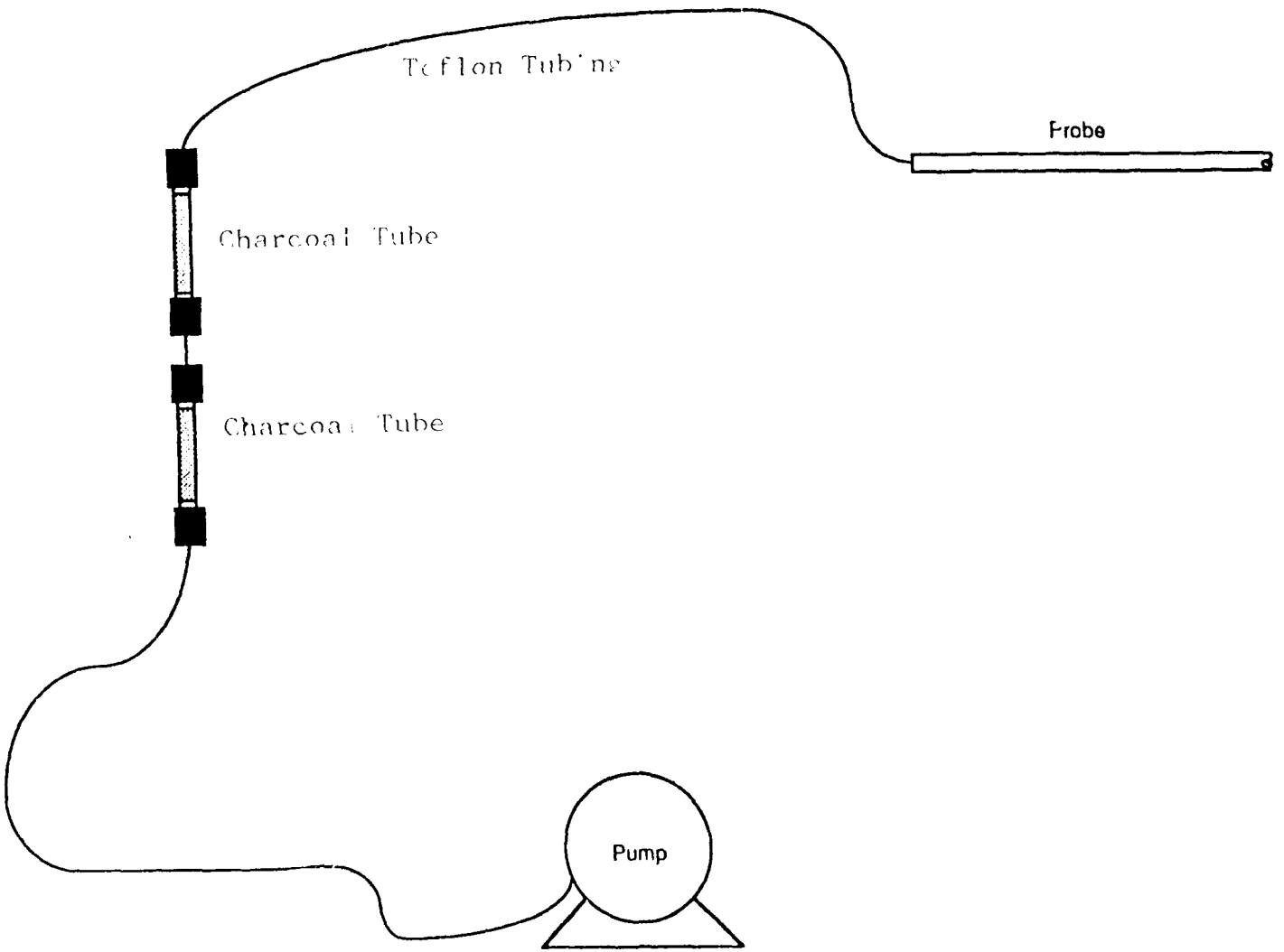


Figure 2. Methylene Chloride Air Sampling Train

E. Results

1. Air Emissions

During run 1, a velocity pressure of 0.53 inches of water was detected in the air stripper vent. However, this value was unable to be duplicated. Therefore, a value of 0.12 inches of water (duplicated during the run) was used to calculate the vent gas velocity. Equipment calibration sheets are found in Appendix D and the resulting methylene chloride calculations are presented in Appendix E. Table 1 provides the final methylene chloride emission test results. Methylene chloride emissions averaged 2.37 lb/hr. This is below limit of 3.75 lb/hr established in the permit to construct.

Table 1. Methylene Chloride Air Emissions Test Results

Run	TOTAL MECL COLLECTED (mg)	SAMPLE VOLUME (dscf)	VENT GAS FLOW RATE (dscfm)	EMISSIONS (lb/hr)
1	64.8	1.0927	114.47	0.8979
2	149.5780	0.7665	114.47	2.9548
3	148.3700	0.7665	127.42	3.2625
			AVG =	2.3717

Note: mg = milligrams
dscf = dry standard cubic foot
dscfm = dry standard cubic foot per minute
lb/hr = pounds per hour

. Wastewater Results:

a. Flow Measurement

The flow rate in the pretreatment facility was calculated by measuring the plant effluent, timing a known volume of effluent. The flow rate averaged 6.3 gallons per minute (23.8 L/mi .

b. Analytical Results

(1) Table 2 provides COD and methylene chloride analysis results for the metal removal package clarifier effluent and facility effluent. The COD results averaged in the metal removal package effluent 5180 mg/L and 4420 mg/L in the pretreatment facility effluent. The methylene chloride results averaged 517.3 mg/L (1.64#/hr in the clarifier and 244.6 mg/L (0.77#/hr) in the pretreatment facility effluent.

Table 2. COD and Methylene Chloride Wastewater Results

TIME SAMPLE TAKEN	COD (mg/L)	MECL (mg/L)	LOCATION	EMISSIONS (#/hr)	% REMOVAL
0953	3000	482.9	CLARIFIER		
				1.16	75.6
1000	2800	117.7	EFFLUENT		
1045	5000	488.9	CLARIFIER		
				0.68	43.8
1052	4200	274.8	EFFLUENT		
1145	5900	716.9	CLARIFIER		
				1.24	54.7
1152	4900	324.4	EFFLUENT		
1245	550	388.9	CLARIFIER		
				0.30	16.6
1250	6 0	294.2	EFFLUENT		
1400	6500	508.9	CLARIFIER		
				0.94	58.1
1400	4200	212.9	EFFLUENT		
AVG.	5180	517.3	CLARIFIER		
				0.863	52.7
AVG.	4420	244.6	EFFLUENT		

note: mg/L = milligrams per liter
#/hr = pounds per hour

(2) The simple linear regression of the COD and the methylene chloride concentrations as performed by a pocket calculator (Texas Instruments, TI-60) resulted in a correlation coefficient (coefficient of determination, r2) of 0.52 (0.84 if only effluent concentrations, or 0.27 if only clarifier concentrations were considered).

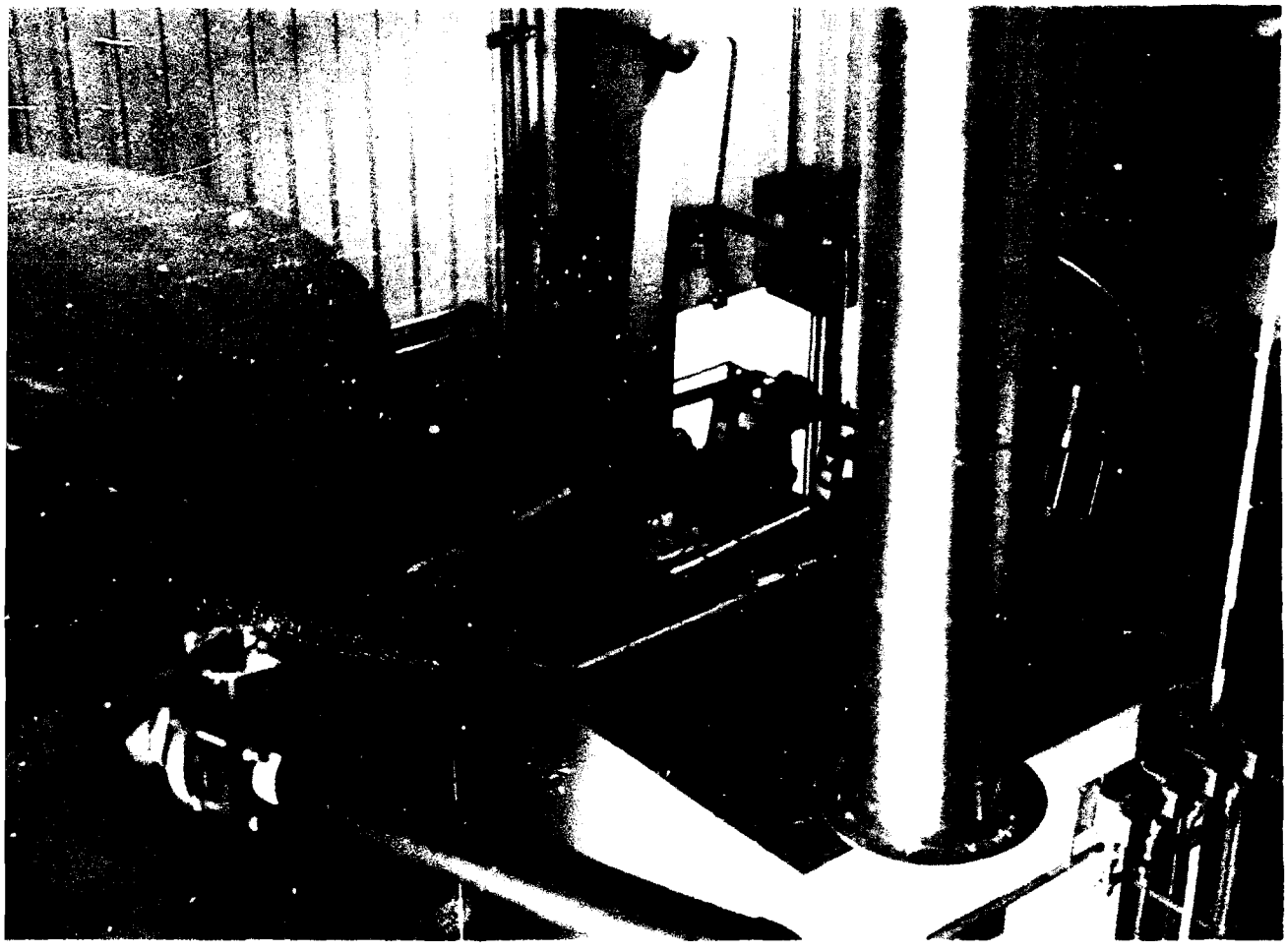


Figure 3. Clarifier Effluent

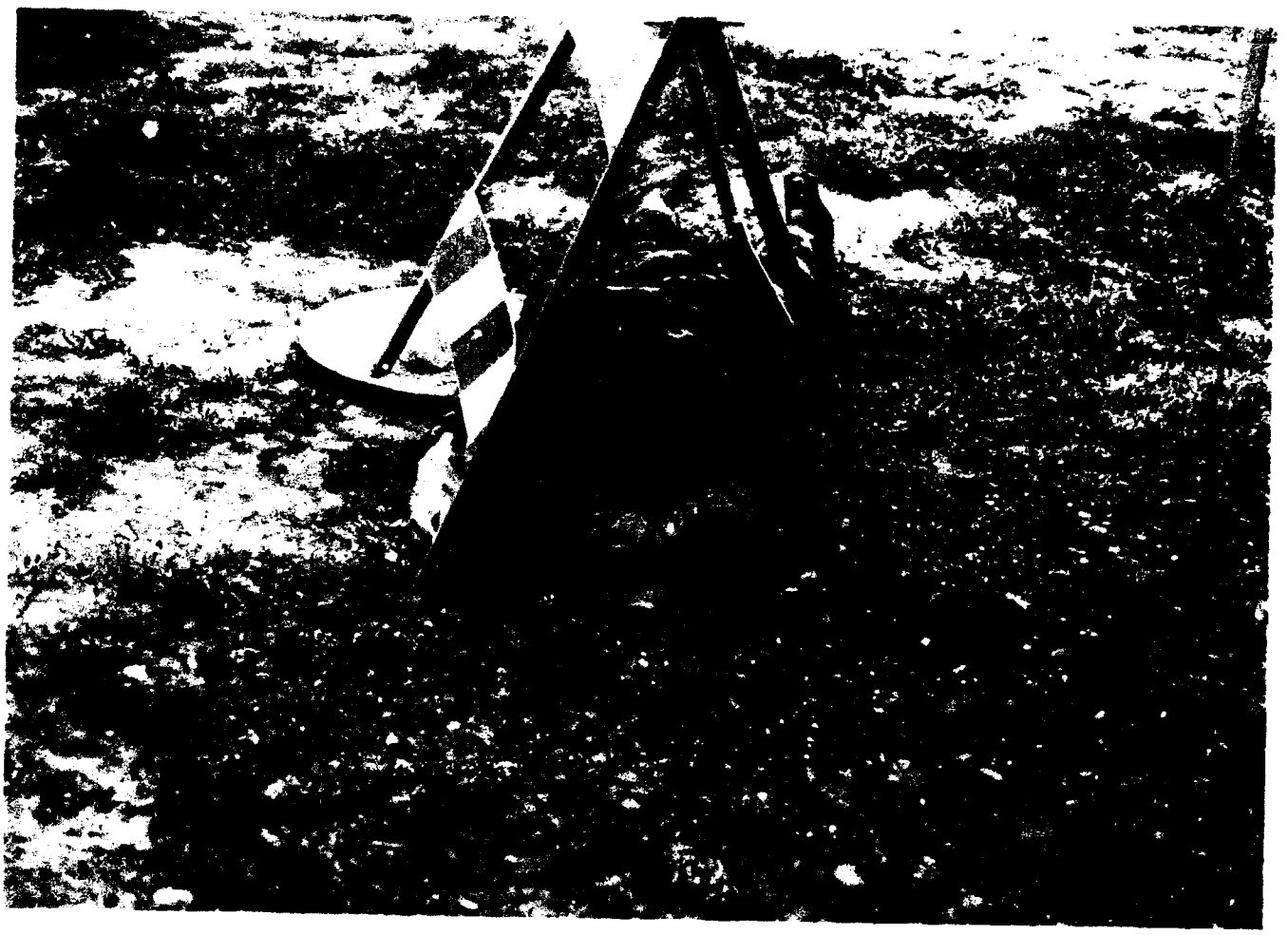


Figure 4. Sanitary Sewer Manhole

III. CONCLUSIONS

A. The plant has operational problems, based on the percent removal calculations from the wastewater stream. Both the results of the wastewater and source emission testing showed methylene chloride emissions were below the permitted rate of 3.75 #/hour. However, this is during operations when the stripping tower is operating at half efficiency. If the stripping tower was operating at 99% efficiency, 3.75 #/hr limit would relate to an average clarifier concentration of 1196 mg/L of methylene chloride. This problem appears to be linked to excessive polymer use and the interference of the polymer to free flow in the stripping tower, providing flooding condition. Flooding in a tower reduces the effective area for liquid to gas diffusion

B. The wastewater and air emissions results correlated adequately, the apparent differences in emissions rates can be related to differences in sampling techniques and the non-homogenicity of the material to be stripped. The wastewater samples were grab samples, representing only snapshots in time while the air samples captured mass over the run, then the mass was converted to a rate by velocity measurements, given a known diameter. Even the air samples are snapshots since velocities were variable, and do not represent truly continuous monitoring over the entire run. Based on a 52.7% efficiency, the air measurements related to an average influent concentration of methylene chloride to the stripping tower of 1420 mg/L.

C. The addition of excessive polymer resulting in high COD concentrations makes any attempt to correlate effluent methylene chloride concentrations to COD questionable, based on the results of linear regression of this data. Correlation of effluent data to COD was strong (0.84), however, not in the range of absolute (1.0) referred to in the operating permit.

D. The pretreatment plant is not meeting the Federal Pretreatment Standard limits for methylene chloride from a new facility treating metal finishing wastes (40 CFR 433.17) of 2.13 mg/L for total toxic organics (TTO), a list in which methylene chloride is included. If the column is operating at 99% removal efficiency, then the influent concentration will be limited to 213 mg/L. Clearly, the column must operate between 99-99.9% efficiency to effectively treat to FPS limits, without further treatment such as carbon absorption, given the known influent concentrations of methylene chloride. A carbon absorption column appears to be needed.

IV. RECOMMENDATIONS

A. Plant operation needs to be optimized. The optimum type and concentration of polymer needs to be determined. In order to facilitate the optimization, the column needs to be cleaned of residual polymer.

B. The manufacturer of the air stripping column needs to be contacted to determine if the column will achieve the needed efficiency for methylene chloride needed to meet FPS. If not, a carbon absorption column may be necessary.

C. Another round of emissions testing is recommended after the plant's operation has been optimized.

REFERENCES

1. Standards of Performance for New Stationary Sources, Title 40, Part 60, Code of Federal Regulations, July 1, 1988.

2. Quality Assurance Handbook for Air Pollution Measurement Systems - Volume III, Stationary Source Specific Methods, U.S. Environmental Protection Agency, EPA-600/4-77-027-b, Research Triangle Park, North Carolina, April 1977.

3. Source Test Calculations and Check Programs for Hewlett-Packard 41 Calculators, U.S. Environmental Protection Agency, EPA-340/1-85-018, Research Triangle Park, North Carolina, September 1985.

4. Federal Pretreatment Standard for Metal Finishing Point Source Category, Title 40, Part 433, Code of Federal Regulations, July 1, 1989.

5. USEPA, Methods for Chemical Analysis of Water and Wastewater, EPA-600/45-79-020, March 1983.

APPENDIX A

Personnel Information

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1. AFOEHL TEST TEAM

Lt Col Robert D. Binovi, Chief Engineer
Capt Paul T. Scott, Chief, Air Quality Function
Capt Ronald W. Vaughn, Consultant, Environmental Quality
Sgt Robert P. Davis, Technician, Environmental Quality

AFOEHL/EQ
Brooks AFB TX 78235-5501

Phone: AUTOVON 240-3305
Commercial (512) 536-3305

2. Vance AFB on-site representatives

Col David Lloyd	Base Commander
Mr. Bob Taylor	Base Civil Engineer
Mr. Bob Holden	Plant Operator
Mr. Max Cumpston	Base Environmental Coordinator AV 962-6208 COM (405) 249-6208
TSgt Steven B. Lamoreaux	USAF Clinic/SGPB
Sgt Tony A. Quintana	USAF Clinic/SGPB AV 962-7241 COM (405) 249-7241

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APPENDIX B

Letter of Request

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND (ATC)
RANDOLPH AIR FORCE BASE TX 78150-5001

O: 11 MAY 90
LTC BINOVI eg

23 APR 1990

SGPB (7-3764)

SUBJECT Request for On-Site Consultant Services - Vance AFB

TO USAF OEHL/CC

1. In accordance with the provisions of AFR 161-17, the attached request for consultant services is forwarded for your consideration. The HQ ATC Environmental Planning Division is asking for an on-site survey of the hazardous waste pretreatment system. They will provide the necessary funds for the services rendered.

2. This request has been coordinated with Lt Col Binovi and most of the technical issues have been discussed. The requested survey is somewhat time-sensitive since Vance must have, within the next 90 days, sampling data to support a needed air emissions permit.

3. Please feel free to contact either the POCs identified in the attached request or Maj Killan of my office.

David A. Hadden

DAVID A. HADDEN, Colonel, USAF, BSC
Command Bioenvironmental Engineer
DCS/Medical Services & Training

1 Atch
HQ ATC/DEEV Ltr, 21 Apr 90

cc: HQ ATC/DEEV wo atch

EQ—Actor

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND (ATC)
RANDOLPH AIR FORCE BASE TX 78150-5001

21 APR 1990

REPLY TO ATTN OF: DEEV

SUBJECT: Combined Air and Wastewater Sampling Support - Vance AFB

TO: SGPB

1. We recently discussed the need for OEHL to do sampling at Vance and provide data for purposes of obtaining an operating permit for the Vance pretreatment system. Please ask the OEHL to perform the combined air and wastewater sampling requirements as discussed among Lt Col Binovi of OEHL, your office and me.

2. Our POC is Capt David Parker, 73240. The POC at Vance is Mr Max Cumpston, AUTOVON 962-6208.

JOSE L. SAENZ, Lt Col, USAF
Chief, Envmtl Planning Div
Directorate of Engrg, Const, and
Envmtl Planning
DCS/Engineering and Services

APPENDIX C

Governing Regulations

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Joan K. Leavitt, M.D.
Commissioner

OKLAHOMA STATE
DEPARTMENT OF HEALTH

P.O. BOX 53551
1000 N.E. TENTH
OKLAHOMA CITY, OK 73152

AN EQUAL OPPORTUNITY EMPLOYER

August 17, 1988

Mr. Gary D. Lynn
Deputy Regional Civil Engineer
Air Force Regional Civil Engineer - Central Region
1114 Commerce Street, Suite 206
Dallas, Texas 75242-0216

Re: Construction Permit 88-054-C
Vance Air Force Base, Oklahoma
Methylene Chloride Stripper/Vent
Garfield County, Oklahoma

Dear Mr. Lynn:

Enclosed is the permit authorizing construction of the referenced facility. Please note that this permit is issued subject to certain standard and specific conditions which are attached.

Thank you for your cooperation in this matter. If we may be of further service, please contact our office.

Very truly yours,

D M Morris

Don M. Morris, Engineer
Permits & Enforcement Division
AIR QUALITY SERVICE

DMM/cw
Enclsr.
cc Mr. James A. Horn
Environmental Engineer
U.S. Army Corps of Engineers
P.O. Box 61
Tulsa, OK 74121
cc Nancy Coleman
AIR QUALITY SERVICE

PERMIT TO CONSTRUCT
AIR POLLUTION CONTROL FACILITY
(continued)

Specific Conditions — Permit No. 88-054-C

1. Points of emission and pollutant mass emission rate limitation:

ID	Emission Source	Methylene Chloride (CH_2Cl_2) lb/hr
V-1	Atmospheric Vent from Methylene Chloride Stripper Column	3.75

2. Upon commencement of operations, the permittee shall initiate the following steps as a means of monitoring operations:

a) Initially, a series of waste water samples shall be analyzed for both (i) the COD demand as indicated by Hach (or equivalent) test kit results and (ii) methylene chloride concentration by laboratory gas chromatograph procedure. A correlation of methylene chloride vs. COD analysis shall be established and a daily COD test procedure implemented on site for methylene chloride analysis.

b) The following system parameters shall be observed each operating day and a log of results maintained on site:

i) Flow rate of waste liquid to stripper (recording flowmeter).
ii) Flow rate of air to stripper (measured or referenced to fan operating curve).
iii) Methylene chloride concentration in both rich and denuded waste liquid (COD/GC test).
iv) Rate (lb/hr) of methylene chloride emitted from stripper (by material balance calculations).

Additionally, at least once weekly the permittee shall:

v) Analyze both the rich and denuded waste liquid for methylene chloride by gas chromatograph and maintain these results in the operations log. These samples should be duplicates of corresponding (daily) COD samples.

Any test result that indicates an emission rate of methylene chloride in excess of that specified in Condition 1 shall be cause for system shutdown and an excess emission episode report to Air Quality Service as soon as practicable during normal office hours.

3. Within 60 days following commencement of operations, the permittee shall submit an application for an operating permit. The test data and correlation developed for methylene chloride analysis should be submitted as a part of the application.

4. Upon issuance of an operating permit, the permittee shall be authorized to operate the facility 24 hours per day, 365 days per year.

5. In order to retain the exemption for the industrial pretreatment unit from hazardous waste regulations, verification that the industrial waste stream is admixed with domestic wastewater prior to entering the industrial waste pretreatment facility must be submitted as a part of the application for the operating permit.

PERMIT TO CONSTRUCT
AIR POLLUTION CONTROL FACILITY
(continued)

Standard Conditions

1. This permit is void 18 months after date of issue unless construction on this project has started on or prior to that date, or if the work involved in the construction is suspended for 18 months or more after it has commenced.

2. The recipient of this permit shall apply for a permit to operate within 60 days following the first day of operation.

3. If any statement or representation in the application is found to be incorrect, this permit may be revoked and the permittee thereupon waives all rights thereunder; however, the application may be amended and a supplemental written permit issued therefor.

4. There shall be no deviation from the approved plans and specifications unless additional or revised plans are submitted to the Air Quality Service and approved.

5. During or after the construction or the installation of the equipment for which this permit was issued, any agent of the State Department of Health shall have the right and authority to inspect such work and operation.

6. If source emission testing of stacks or process vents is determined necessary, the holder of this permit is responsible for providing sampling facilities and conducting the sampling test at his own expense.

7. When applicable, any records necessary to ascertain continued compliance shall be maintained by the permit holder and made available at the request of personnel from Air Quality Service.

8. That the Air Quality Service of the Oklahoma State Department of Health shall be kept informed on occurrences which may affect the eventual performance of the facility or that will unduly delay the progress of the project.

9. The permit incorporates by reference all statements or representatives of limitations addressed by the applicant in the application and supplemental supporting data and further incorporates any and all limitations calculated or established in the Air Quality Analysis resulting in the issuance of this permit.

10. This permit incorporates by reference all approved air quality control regulations in effect at the issuance of this permit including affirmative actions herein or hereafter required by the Commissioner and all emission limits established in the several control regulations subject only to more stringent limits specifically or generally contained in this permit.

1984, however metal finishing facilities which are also covered by Part 420 (iron and steel) need not comply before July 10, 1985. Compliance with the provisions of paragraphs (a) and (b) of this section shall be achieved as soon as possible, but not later than February 15, 1986.

[48 FR 32485, July 15, 1983, as amended at 48 FR 41410, Sept. 15, 1983; 48 FR 43682, Sept. 26, 1983]

§ 433.16 New source performance standards (NSPS).

(a) Any new source subject to this subpart must achieve the following performance standards:

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.11	0.07
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	
Oil and Grease	52	26
TSS	60	31
pH	(1)	(1)

[1] Within 6.0 to 9.0

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to those limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

[48 FR 32485, July 15, 1983; 48 FR 43682 Sept. 26, 1983]

§ 433.17 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR Part 403 and achieve the following pretreatment standards for new sources (PSNS):

PSNS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.11	0.07
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to these limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treat-

ment to achieve compliance with this limitation.

(d) An existing source submitting a certification in lieu of monitoring pursuant to § 433.12 (a) and (b) of this regulation must implement the toxic organic management plan approved by the control authority.

[48 FR 32485, July 15, 1983; 48 FR 43682, Sept. 26, 1983]

PART 434—COAL MINING POINT SOURCE CATEGORY BPT, BAT, BCT LIMITATIONS AND NEW SOURCE PERFORMANCE STANDARDS

Subpart A—General P ovisions

Subpart B—Coal Preparation Plants and Coal Preparation Plant Associated Areas

Subpart C—Acid or Ferruginous Mine Drainage

Subpart D—Alkaline Mine Drainage

Supbart E—Post-Mining Areas

Subpart F—Miscellaneous Provisions

APPENDIX D

Calibration Data

(This page l ank)

INDUSTRIAL HYGIENE SAMPLING DATA

(Use this space for mechanical imprint)

OEHL USE ONLY

WORKPLACE IDENTIFIER

BASE: Vance AFB (WORKPLACE) | ORGANIZATION: CE

Pretreatment Facility

DATE COLLECTED (YYMMDD): 910524 | BLDG NO./LOCATION: Bldg 193 | ROOM/AREA:

MAIL REPORTS TO (circle if changed): ORIGINAL: AFOEHL/IEUE | COPY 1: Bldg 125W Capt Vaughn | COPY 2:

SAMPLE COLLECTED BY (Name, grade, AFSC): Ronald W. Vaughn, Capt | SIGNATURE: Ronald W. Vaughn | AUTOVON Local: 2891

REASON FOR SUBMISSION: H | A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP R-ROUTINE/PERIODIC SURVEY O-OTHER (Specify) | OEHL PID:

SOURCE BEING SAMPLED: Air Strippers / Permit Application

EXISTING CONTROLS (Personal Protective Equipment, Engineering, Administrative): N/A

SAMPLE COLLECTION DATA

EMPLOYEE NAME & SSAN OR SAMPLE LOCATION		Vent	Vent	Vent
OEHL SAMPLE NO.				
BASE SAMPLE NO.		PY900008	PY900009	PY900010
COLLECTING MEDIA		CTCT101	CTCT101	CTCT101
ANALYSES REQUESTED	A NAME	Methylene Chloride	Methylene Chloride	Methylene Chloride
	A NIOSH NO.	PA8050000	PA8050000	PA8050000
	B NAME			
	B NIOSH NO			
	C NAME			
	C NIOSH NO			
	D NAME			
	D NIOSH NO.			
PUMP OR MONITOR NO.		1791	1790	1791
COLLECTION TIME. OFF/ON		1107 / 1020	1107 / 1020	1205 / 1118
TOTAL COLLECTION TIME		67 min	67 min	47 min
FLOW RATE: ON/OFF		0.5LPM / 0.5LPM	0.5LPM / 0.5LPM	0.5LPM / 0.5LPM
VOLUME SAMPLED		33.5 L	33.5 L	23.5 L
TEMPERATURE/BAROMETER		81°F / 28.320	81°F / 28.320	81°F / 28.320
RELATIVE HUMIDITY/WIND		/	/	/
SUPPORTING SAMPLES	OEHL SAMPLE NO.			
	BASE SAMPLE NO			
	NOMENCLATURE			

COMMENTS: Priority

SUMMARY OF SURVEY RESULTS (See reverse for calculations)

CALCULATED EXPOSURE CONCENTRATIONS | STANDARDS

AF FORM JAN 81 2750

INDUSTRIAL HYGIENE SAMPLING DATA

(Use this space for mechanical imprint)

OEHL USE ONLY

WORKPLACE IDENTIFIER

BASE: Vance AFB

ORGANIZATION: CE

WORKPLACE: Pretreatment Facility

DATE COLLECTED (YYMMDD): 910 0 5 2 1 4

BLDG NO./LOCATION: Bldg 193

ROOM/AREA:

MAIL REPORTS TO (circle if changed): ORIGINAL AFOEHL/EQE Bldg 175W Capt Vaughn; COPY 1; COPY 2

SAMPLE COLLECTED BY (Name, grade, AFSC): Ronald W. Vaughn Capt

SIGNATURE: Ronald W. Vaughn

AUTOVON: 2591

OEHL PID:

REASON FOR SUBMISSION: H O (A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP R-ROUTINE/PERIODIC SURVEY O-OTHER (Specify))

SOURCE BEING SAMPLED: Air Stripper / Permit Application

EXISTING CONTROLS (Personal Protective Equipment, Engineering, Administrative): N/A

SAMPLE COLLECTION DATA

EMPLOYEE NAME & SSAN OR SAMPLE LOCATION	Vent	Vent	Vent
OEHL SAMPLE NO.			
BASE SAMPLE NO.	PY90011	PY90012	PY90013
COLLECTING MEDIA	CTCT101	CTCT101	CTCT101
ANALYSES REQUESTED A NAME	Methylene Chloride	Methylene Chloride	Methylene Chloride
A NIOSH NO	PA8050000	PA8050000	PA8050000
B NAME			
B NIOSH NO			
C NAME			
C NIOSH NO			
D NAME			
D NIOSH NO			
PUMP OR MONITOR NO.	1791	1790	1790
COLLECTION TIME OFF/ON	1205 / 1118	1300 / 1213	1300 / 1213
TOTAL COLLECTION TIME	47 min	47 min	47 min
FLOW RATE ON/OFF	0.5LPM / 0.5LPM	0.5LPM / 0.5LPM	0.5LPM / 0.5LPM
VOLUME SAMPLED	23.5L	23.5L	23.5L
TEMPERATURE/BAROMETER	81°F / 28.320	91°F / 28.320	81°F / 28.320
RELATIVE HUMIDITY/WIND	/	/	/
SUPPORTING SAMPLES OEHL SAMPLE NO.			
SUPPORTING SAMPLES BASE SAMPLE NO.			
SUPPORTING SAMPLES NOMENCLATURE			

COMMENTS: Priority

SUMMARY OF SURVEY RESULTS (See reverse for calculations)

CALCULATED EXPOSURE CONCENTRATIONS	STANDARDS

AF FORM JAN 81 2750

INDUSTRIAL HYGIENE SAMPLING DATA

OEHL USE ONLY

(this space for mechanical imprint)

WORKPLACE IDENTIFIER

BASE: Vance AFB

ORGANIZATION

WORKPLACE: Pretreatment Facility

DATE COLLECTED (YYMMDD): 10 05 24

BLDG NO./LOCATION: Bldg 193

ROOM/AREA

MAIL REPORTS TO (Circle if changed): ORIGINAL, COPY 1, COPY 2 — AFOEHL/EQE Bldg 175W Capt Vaughn

SAMPLE COLLECTED BY (Name, grade, AFSC)

SIGNATURE: Ronald W Vaughn

AUTOVON 2891 Local

REASON FOR SUBMISSION: H

A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOW-UP/CLEANUP
R-ROUTINE/PERIODIC SURVEY O-OTHER (Specify)

OEHL PID

SOURCE BEING SAMPLED

Air Stripper / Permit Application

EXISTING CONTROLS (Personal Protective Equipment, Engineering, Administrative)

N/A

SAMPLE COLLECTION DATA

EMPLOYEE NAME & SSAN OR SAMPLE LOCATION		Vent	Vent
OEHL SAMPLE NO.			
BASE SAMPLE NO.		PY900014	PY900015
COLLECTING MEDIA		CTCT101	CTCT101
ANALYSES REQUESTED	A NAME	Methylene Chloride	Methylene Chloride
	A NIOSH NO.	PA800S0000	PA800S0000
	B NAME		
	B NIOSH NO.		
	C NAME		
	C NIOSH NO		
	D NAME		
	D NIOSH NO.		
PUMP OR MONITOR NO.		1790	1790
COLLECTION TIME: OFF/ON		1400 / 1313	1400 1313
TOTAL COLLECTION TIME		47 min	47 min
FLOW RATE: ON/OFF		0.5LPM / 0.5LPM	0.5LPM 0.5LPM
VOLUME SAMPLED		23.5L	23.5L
TEMPERATURE/BAROMETER		81°F /	81°F / 28.320
RELATIVE HUMIDITY/WIND		/	/
SUPPORTING SAMPLES	OEHL SAMPLE NO.		
	BASE SAMPLE NO		
	NOMENCLATURE		

COMMENTS

Priority

SUMMARY OF SURVEY RESULTS (See reverse for calculations)

CALCULATED EXPOSURE CONCENTRATIONS	STANDARDS

AF FORM 2750 JAN 81

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APPENDIX E

Methylene Chloride Emissions Calculations

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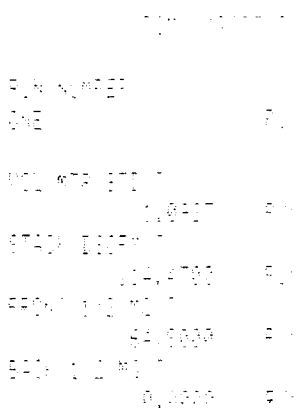

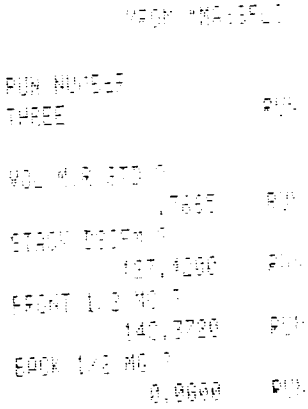

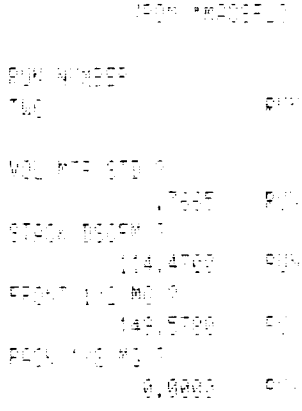

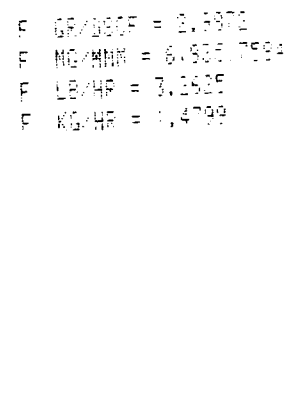

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